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10/663,282	09/16/2003	Yasuyuki Matsuya	5259-000031	3218

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EXAMINER	
BRINEY III, WALTER F	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/663,282	MATSUYA, YASUYUKI	
	Examiner	Art Unit	
	Walter F. Briney III	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *6 and 7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 8-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1, 2, 4, 5, 8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Sulavuori et al. (US Patent 5,636,264).**

Regarding **Claim 1**, Sulavuori discloses a method of transmitting information (column 2, lines 39-43) comprising: on a transmitting side (Fig. 4A) converting speech signals from an interface 100 into a digitized speech signal 11 using CVSD (i.e., a noise shaping method) (column 7, lines 28-39) in an NRZ 1- bit data stream (Fig. 1, waveform B); using a high level for digital "1" and a low level for digital "0" (Fig. 1, waveform B), and using a return to zero pulse with a pulse width smaller than the pulse width of the NRZ signal to represent the high level (Fig. 1, pulse P) and a low level to represent the low level (Fig. 1) (column 3, lines 14-30); transmitting the signals as IR pulses (i.e., radio signals) (column 3, lines 3-7); and on a receiving side (Fig. 4B) driving an earphone 201 to produce a sound output by electrical signals obtained from the received signals (column 8, lines 3-30).

Regarding **Claim 2**, Sulavuori discloses a transmitting apparatus (Fig. 4A) comprising: a speech encoding block 104 that corresponds to the 1-bit conversion section claimed and converts speech signals into an NRZ 1- bit data stream (Fig. 1, waveform B) using CVSD (i.e., a noise shaping method) (column 7, lines 28-39); a pulse shaper block 105 that corresponds to the

return-to-zero section claimed and uses a return to zero pulse to represent the high level (Fig. 1, pulse P) and a low level to represent the low level (Fig. 1); and an IR transmitter 106 that corresponds to the radio transmitting section claimed and transmits the signals as IR pulses (i.e., radio signals) (column 3, lines 3-7).

Regarding **Claims 4 and 5**, Sulavuori further discloses pulse width to bit time ratios of 0.128 (i.e., 12.8%) (column 6, lines 17-29) and 0.064 (i.e., 6.4%) (column 6, lines 30-44), either of which meets the ranges of both claims.

Regarding **Claim 8**, Sulavuori discloses a receiving apparatus (Fig. 4B) cooperating with the transmitting apparatus (Fig. 4A) comprising: an IR receiver 206 that corresponds to the radio receiving section claimed and receives infrared pulses that correspond to the return-to-zero digital signals claimed obtained by converting speech signals from an interface 100 into a digitized speech signal 11 in an NRZ 1- bit data stream (Fig. 1, waveform B & fig.4A, representing the transmitting apparatus); a pulse stretching block 215 that corresponds to the drive section claimed and transforms received pulses into a binary digital signal that corresponds to the return-to-zero drive signals claimed to drive a speech decoding block 216, low-pass filter 217 and earphone 210 that together correspond to the sound output section claimed and convert the electrical signals into sound signals (column 8, lines 24-30; column 7, lines 49-64).

Regarding **Claim 10**, Sulavuori further discloses a pulse stretching block 215 that corresponds to the pulse width extension section claimed (column 8, lines 24-30; column 7, lines 49-64).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sulavuori in view of admitted prior art.**

Regarding **Claim 3**, as shown above apropos of Claim 2, Sulavuori anticipates all elements except use of the physical layers of Fast IrDA physical layer digital infrared communication standard. As applicant admits in the claim, the physical layers of Fast IrDA is a physical layer digital infrared communication standard. Sulavuori discloses a digital infrared communication interface. One skilled in the art would have known that use of a standard interface facilitates design and availability of components and insures operability. It would have been obvious to one skilled in the art at the time of the invention to apply the standard physical layers of Fast IrDA to the transmitter taught by Sulavuori for the purpose of realizing the aforesaid advantages.

Regarding **Claim 9**, as shown above apropos of Claim 8, Sulavuori anticipates all elements except use of the physical layers of Fast IrDA physical layer digital infrared communication standard. As applicant admits in the claim, the physical layers of Fast IrDA is a physical layer digital infrared communication standard. Sulavuori discloses a digital infrared communication interface. One skilled in the art would have known that use of a standard interface facilitates design and availability of components and insures operability. It would have been obvious to one skilled in the art at the time of the invention to apply the standard physical

layers of Fast IrDA to the transmitter taught by Sulavuori for the purpose of realizing the aforesaid advantages.

3. **Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sulavuori in view of any one of Law (US Patent 6,064,699), Smith III et al. (US Patent 4,627,090) or Dean et al. (US Patent 5,008,964).**

Regarding **Claim 11**, Sulavuori further discloses a low-pass filter 217 that filters the decoded speech signals before reproduction by earphone 201. Therefore, Sulavuori anticipates all elements except a high pass filter that removes a DC component. Law discloses a CVSD demodulator (Fig. 12C) with a capacitor C11 that corresponds to the high pass filter claimed and removes a DC component in the input to amplifier 270 (column 7, lines 57-62). Smith discloses a CVSD demodulator (Fig. 2) with capacitors (output of amplifier in 500 and input of loudspeaker 560) that correspond to the high pass filter claimed and remove a DC component in the input to amplifier 104 and loudspeaker 44. Dean discloses a CVSD demodulator (Fig. 3C) with capacitors (Fig. 7, output of 100 and between 104 and 44) that correspond to the high pass filter claimed and remove a DC component in the input to amplifier 104 and loudspeaker 44. One skilled in the art would have known that such an arrangement optimizes the dynamic range of the amplifier and loudspeaker. As such, it would have been obvious to one skilled in the art at the time of the invention to apply the high-pass filtering capacitor taught by any one of Law, Smith or Dean to the receiver taught by Sulavuori for the purpose of realizing the aforesaid advantage.

4. **Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sulavuori in view of any one of Law, Smith or Dean and further in view of Hamasaki et al. (US Patent 5,815,051) and Quintus et al. (US Patent 4,833,418).**

Regarding **Claims 12 and 13**, as shown above apropos of Claim 11, the combination of Sulavuori and any one of Law, Smith or Dean makes obvious all elements except the structure of the filters claimed. A low-pass filter disclosed in Quintus (Fig. 3, reference 150; column 5, lines 43-54) and a high-pass filter disclosed in Hamasaki (Fig. 16; column 8, lines 47-60) that combine to form the filter section claimed. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the filter structures of Quintus and Hamasaki in the combination made obvious by Sulavuori and any one of Law, Smith or Dean. Applicant has not disclosed that the particular filter structures claimed provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with the filter structures taught by Quintus and Hamasaki in any relative disposition because the changing the relative position of cascaded passive filters does not affect the resultant characteristic. Therefore, it would have been obvious to one of ordinary skill in the art to modify the combination made obvious by Sulavuori and any one of Law, Smith or Dean to obtain the invention as specified in Claims 12 and 13.

Response to Arguments

Applicant's arguments filed 12 September 2007 have been fully considered but they are not persuasive.

Apropos claim 1, applicant recognizes that the examiner rejected the noise-shaping A/D converter with the CVSD A/D converter disclosed by *Sulavuori*, and applicant argues that the claimed converter and the *Sulavuori* converter are different from each other. Arguments at 16-17. In support of his argument, applicant relies on reference diagrams included with his reply. The diagrams allegedly show the structure of both an CVSD A/D converter and the claimed noise-shaping A/D converter. Since the structures in these diagrams do not benefit from support in the applicant's originally filed application they must be submitted by affidavit or declaration under 37 C.F.R. § 1.132:

> *"When any claim of an application or a patent under reexamination is rejected or objected to, any evidence submitted to traverse the rejection or objection on a basis not otherwise provided for must be by way of an oath or declaration under this section."*

Anticipating applicant's filing of an appropriate affidavit/declaration, the examiner notes that applicant's specification does not limit the claimed noise-shaping A/D converter to a specific structure, or noise-shaping algorithm, including the structure illustrated in applicant's reference diagrams 9-10 (apparently a compressional A/D converter; i.e. sigma-delta modulator, which is a specific type of noise shaping converter.) In fact, applicant only seems concerned in solving jitter in non-compressional A/D converters. Specification at p. 5 ll. 1-2, p. 6 ll. 15-18. Claim 1 recites, "converting analog signals...into...digital signals...using a noise shaping method." The only obstacle to understanding this portion of claim 1 is the term "noise shaping." Noise shaping is known in the art of digital signal processing as a bit reduction technique used to minimize

quantization error. Noise Shaping – Wiki, http://en.wikipedia.org/wiki/Noise_shaping (retrieved 24 November 2007) at § "Noise shaping." Noise shaping techniques include a feedback loop that includes a measure of the error encountered by quantizing a signal input to the quantizer: (1) y(n)=x(n)+E(x(n-1)). *Id.* at § "How noise shaping works." Nothing in applicant's specification appears to define noise shaping in other terms. At most, applicant refers to two prior art noise shaping A/D converters, but neither applicant's specification nor those two pieces of prior art disclose that noise shaping must be performed in a manner divergent from the general understanding noted supra by examiner. Accordingly, the general understanding in the art governs the interpretation used in this Office Action.

The general description appears to fit the definition of CVSD: A delta modulation scheme that quantizes the difference between an input sample and a previously quantized input sample. Continuously variable slope delta modulation – Wiki, http://en.wikipedia.org/wiki/CVSD (retrieved 24 November 2007) at "Continuously variable slope delta modulation." Specifically, the output of the quantizing element is fed back to the input of the quantizer after a subtraction element subtracts the quantizer output from a currently input sample—(2) y(n)=x(n)-Q(x(n-1)); (3) Q(x(n-1))=x(n-1)+E(x(n-1)); (4) y(n)=x(n)-x(n-1)-E(x(n-1)). *Id.* Comparing equations (1) and (4) reveals that the output of a CVSD filter is the difference between a noise-shaped current sample and the previous sample. Since the CVSD A/D converter appears to perform noise-shaping in accordance with the general understanding of noise shaping, the

examiner holds CVSD as anticipatory of the claimed noise shaping method used in converting analog signals to digital signals.

Further apropos claim 1, applicant alleges that *Sulavuori* does not allow jitter suppression as the instant invention does. Arguments at 17. Jitter suppression is not an element of claim 1 nor any other claim. Because jitter suppression is not claimed, applicant's allegation is moot since the claims are the final means by which the invention is judged.

Further apropos claim 1, applicant alleges that *Sulavuori* does not allow speaker driving using D-class amplifiers as the instant invention does. Arguments at 18. D-class speaker driving is not an element of claim 1 nor any other claim. Because D-class speaker driving is not claimed, applicant's allegation is moot since the claims are the final means by which the invention is judged.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/wfb/
11/26/07

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SUPERVISORY PATENT EXAMINER